

Glossary of Terms

Term	Definition
16 S rRNA gene	Gene encoding for ribosomal RNA which is found in all bacteria.
18S analysis	Gene encoding for ribosomal RNA which is found in all eukaryotic cells.
Aichivirus	Human pathogenic virus that causes gastroenteritis and is found in high numbers in human feces.
API 20E biochemical strip	Test strip containing 20 separate biochemical tests that can be used to determine the species of an enteric (fecal) bacterium based on its metabolism.
Avirulent	Lacking the ability to cause disease.
Biomarker	A biological target than can be used to identify a bacterium or metabolic status.
Conventional PCR	Polymerase chain reaction (PCR) is a fast technique used to only copy small segments of DNA in a sample.
<i>Cryptosporidium</i>	A microscopic parasite that causes diarrhea.
Culturable cells	Bacterial cells that can grow and form colonies on conventional agar plates.
<i>Cyclospora</i>	A one-celled protozoan parasite that causes the intestinal illness cyclosporiasis by infecting cells of the intestinal tract.
Dormancy	A physiological state whereupon cells down-regulate metabolism and stop replicating. The cells exhibit metabolic activity and exhibit stress tolerance.
eae virulence gene	<i>E. coli</i> "attachment and effacing" gene in pathogenic <i>E. coli</i> , which encodes for the intimin protein that allows <i>E. coli</i> to attach to intestinal cells.
Enterovirus	Genus of viruses which include numerous human foodborne pathogens.
Envirochek high-volume (HV) filter	Filter used for concentrating <i>Cyclospora</i> from environmental water samples, manufactured by Pall Gelman, Inc. (Ann Arbor, Michigan).
<i>Escherichia coli</i>	A bacterium commonly found in the intestines of humans and other animals, where it usually causes no harm. Some strains can cause severe food poisoning, especially in old people and children.
Ethylenediaminetetraacetic acid (EDTA)	An iron chelating compound.
Eukaryotic organism	Nearly all organisms are eukaryotic, with the exception of bacteria and viruses. This includes mammals, birds, reptiles, plants, etc., in addition to parasites, protozoa, fungi, and algae.
False negative test	A test result that fails to detect or confirm the presence of target within a sample despite the bacterium being present.
Free chlorine	A measure of the antimicrobial form of hypochlorite present in solution.
Gel electrophoresis	A method for separation and analysis of macromolecules, such as DNA and their fragments, based on their size and charge.
HA filter	Membrane filter commonly used to concentrate viruses from small volumes of water (<10 liters).

Glossary of Terms

Term	Definition
HPC bacteria	Heterotrophic plate count bacteria are species that use organic carbon to grow. They are used to determine the overall bacteriological quality of water. Increasing numbers of HPC in water can indicate declining water quality.
Index organism	Organism that is a marker whose presence relates to the possible occurrence of ecologically similar pathogens. Hence detection of an index organism (e.g., <i>Listeria</i> spp.) would suggest an increased likelihood of presence of a pathogen (in this case <i>Listeria monocytogenes</i>).
Indicator organism	Organism that is a marker whose presence relates to the general microbiological condition of the food or environment (i.e., hygienic quality). For example, many may consider <i>E. coli</i> an indicator organism that can be used to assess the hygienic quality of water.
Indole	Heterocyclic organic aromatic compound that can act as a metabolic regulator in bacteria, plants and animals.
Infiltration vs. internalization	Infiltration refers to a passive process whereby microorganisms enter plant tissues, usually carried by water. Internalization refers to an active process whereby a microorganism enters and becomes established in plant tissues.
Lettuce extract	A preparation derived from the sterile filtrate of a lettuce homogenate.
<i>Listeria monocytogenes</i>	A foodborne bacterium capable of causing serious to life threatening disease in humans.
M9 media	A minimal, defined medium that is low in nutrients used to culture <i>E. coli</i> .
Moore swab	Pleated fans made of gauze, formed by taking a sheet of gauze and tying together in the middle. Moore swabs are placed in waterways (e.g., irrigation water sources) for a given period of time (e.g., 24 h) to capture and absorb bacteria for subsequent microbial testing. Moore swabs can provide a "snapshot" of the microbial community in the given waterway for the given period of time.
MPN	A statistical technique for enumerating bacterial numbers within a sample. The method is based on recording the growth of bacteria within a 3, 5 or 10 tube set of dilutions, and then referring to MPN tables.
NCBI BLAST	National Center for Biotechnology Information Basic Local Alignment Search Tool. A BLAST search enables a researcher to compare DNA and protein sequences to a sequence database and identify library sequences that calculates the statistical significance of matches.
Next generation sequencing	High throughput sequencing of nucleic acids that allows for the sequencing of millions of fragments of DNA in parallel. This greatly decreases the time required for sequencing.
NGS	Next generation sequencing.
PAA	Peroxyacetic acid.
Pathogen	Microorganism capable of causing disease.

Glossary of Terms

Term	Definition
PCR	Polymerase chain reaction to detect the presence of a marker gene within a bacterial target.
Persister breaker	An agent or agents that can break the dormant state within <i>E. coli</i> thereby facilitating growth on growth media and increased susceptibility to stress.
Persister cell	A sub-population within a culture that is induced into a state of dormancy despite being under conditions that enable growth. Persisters have enhanced tolerance to stress and resistance to antibiotic-mediated killing.
Persister fraction	The ratio of persisters present in a bacterial culture relative to non-persister cells.
Persister inducer	An agent or agents that can induce the persister state within <i>E. coli</i> .
Persister state vs. normal state	A bacterial culture consists of a mixture of growing cells, slow-growing cells, tolerant cells and cells within a persister state. A persister culture is one whereby only the dormant cells can be recovered when the growing cells, slow-growing cells and tolerant cells have been inactivated.
Phenotype	Observable characteristics of an individual. Results from the interaction of its inherent genetic characteristics with the environment.
Plate count	A microbial count derived from culturing bacteria on an agar plate.
Quantitative PCR	qPCR or real-time polymerase chain reaction (PCR) is used to copy small segments of DNA, and quantifies how much of the target DNA is present in the sample.
<i>Salmonella</i>	A bacterium that occurs mainly in the intestine, especially a serotype causing food poisoning.
Sanitizer vs. antimicrobial	The term sanitizer refers to substances designed for killing microorganisms on surfaces in the food processing environment. The generic term antimicrobial refers to any substance capable of killing microorganisms.
Shiga toxin-producing <i>Escherichia coli</i> (STEC)	A sub-set of <i>E. coli</i> that harbor the Shiga toxin gene.
Single nucleotide polymorphism (SNP)	A single difference in a DNA building block (nucleotide), which can be discovered by comparing sequences of genes from different isolates. For example, sequences of ACCTGCA and ATCTGCA differ by 1 SNP (nucleotide number 2, which is a C in sequence 1 and a T in sequence 2).
Stationary cells	A bacterial culture that has ceased growing due to depletion of nutrients or accumulation of metabolic products.
Strain	A bacterial isolate that has been characterized to a point where it can be differentiated from another strain. Two isolates represent different strains if they can be differentiated by a subtyping methods. "Subtype" and "strain" are often used interchangeably.
Surrogate organism	Harmless organisms that have similar resistance properties to pathogenic or spoilage organisms and can be used as substitute in processing environments or under other conditions where the target organism should not be introduced.

Glossary of Terms

Term	Definition
Surrogates	Avirulent microorganisms that have similar resistance and survival properties to pathogens.
TaqMan probe	Consists of fluorophores that are designed to increase the specificity of qPCR reactions.
Top (Big 7) STEC	Shiga toxin-producing <i>E. coli</i> that have been implicated in causing foodborne illness that could potentially lead to hemolytic uremic syndrome (HUS; kidney failure). The Top 7 include serotypes O157:H7, O26, O45, O103, O111, O121 and O145.
Tryptic soy agar (TSA)	A rich, undefined medium based on soy.
Viability staining	A stain that differentiates between viable and dead cells. Enumeration can be performed by passing through a flow cytometer or under a fluorescent microscope.
Viable but non-culturable (VBNC)	A dormant sub-population within a bacterial culture, which is caused by imposing prolonged stress and cannot be cultured.
Viable cells	Bacteria that are alive; they may or may not be able to grow and form colonies on conventional agar plates.
Virulence	The potential of a pathogen to cause illness when ingested by a human or animal host.